

REMARKS

In the Final Office Action, the Examiner rejected claims 31-45 under 35 U.S.C 103(a) as being unpatentable over *LyMBERopoulos et al.* (U.S. Patent No. 6,085,688) in view of *Hills et al.* (U.S. Patent No. 6,217,786 B1). No claim has been amended, however, all pending claims have been reproduced for the Examiner's convenience in Appendix A. Reconsideration of the application is respectfully requested based on the following remarks.

Independent claim 31 pertains to a method for controlling processing uniformity while processing a substrate using a plasma-enhanced process. Claim 31, among other things, recites flowing reactant gases into the plasma processing chamber, the reactant gases include a combination of gases, wherein two or more gases of said combination of gases included in the reactant gases is a $C_x F_y H_z O_w$ gas.

The examiner admits that there is no teaching in *LyMBERopoulos et al.* with respect to gas chemistries used in the etching process. (Final Office Action, page 3). Firstly, it should be noted that the serious deficiencies of *LyMBERopoulos et al.* cannot possibly be cured by *Hills et al.* since *LyMBERopoulos et al.* does not even address the gas chemistries used in the etching process. Nevertheless, the Examiner proposes to combine the teaching of *Hills et al.* to overcome the deficiencies of *LyMBERopoulos et al.* Accordingly, it is respectfully submitted that the Examiner has failed to establish a prima facie case of obviousness. In the Office Action, the Examiner asserts that it would have been obvious to one of ordinary skilled in the art at the time of the invention to flow the claimed gas chemistries. To support this assertion, however, the Examiner merely states that use of the claimed gas chemistries would have been "anticipated to produce an expected result." The Examiner does not provide any evidence for this assertion. The Applicant respectfully requests that the Examiner provide evidence which supports this assertion.

Furthermore, contrary to the Examiner's assertion, there is no teaching in *Hills et al.* with respect to flowing a combination of gases, wherein two or more gases of the combination of gases is a $C_x F_y H_z O_w$ gas. In the Final Office Action, the Examiner asserts that use of specific fluorocarbons C_2F_6 , C_3F_8 and C_4F_8 are taught by *Hills et al.* (Final Office Action, page 3). Again, it is respectfully submitted that the claim 31 recites use of two or more gases of the combination of gases is a $C_x F_y H_z O_w$ gas. *Hills et al.* does not teach using such a combination of reactant gases. Instead, *Hills et al.* teaches flowing an etching

gas that includes a Fluorocarbon gas, a Nitrogen reactant gas, an Oxygen reactant gas, an inert carrier gas, and a Hydrogen containing additive gas into the plasma reactor. (*Hills et al.*, Abstract). Accordingly, it is respectfully submitted that the cited references taken alone or in any proper combination do not teach or suggest these limitations. Accordingly, it is respectfully submitted that independent claim 31 is patentable over cited art for at least these reasons alone.

Again, it should also be noted, *Lymberopoulos et al.* and *Hills et al.* fail to teach other features of the claimed invention. For example, there is no teaching in *Lymberopoulos et al.* and *Hills et al.* with respect to changing the radial variation in a controlled magnetic field within a plasma processing chamber in a region proximate to an antenna to improve the processing uniformity across the substrate. In the Final Office Action, the Examiner states that this limitation is suggested by *Lymberopoulos et al.* since the need to eliminate uneven charging is the goal of the invention. And, since uneven charging is the result of non-uniform processing, the Examiner asserts that uniform processing of the substrate is suggested by *Lymberopoulos et al.* (Final Office Action, page 7). It is submitted that uniform processing is a desirable result. However, the Examiner needs to show that *Lymberopoulos et al.* teaches that uniform processing can be improved by changing the radial variation in a controlled magnetic field within a plasma processing chamber in a region proximate to an antenna to improve the processing uniformity across the substrate. Instead, the Examiner merely asserts that *Lymberopoulos et al.* suggests this feature since it suggests that controlling the magnetic field can reduce charge build up which is the result of non-uniform processing. It is earnestly believed that *Lymberopoulos et al.* does not teach changing the magnetic field in the context of the invention.

In view of the foregoing, it is respectfully submitted that the cited references taken alone or in any proper combination do not teach or suggest the claimed invention. Accordingly, it is respectfully submitted that independent claim 31 is patentable over the cited art for at least these reason alone. Furthermore, claims that depend on claim 31 are patentable over the cited art for at least the same reasons as discussed above. Moreover, the dependent claims recite additional features that render them patentable for additional reasons. Additional limitations recited in the independent claims or the dependent claims are not further discussed as the above-discussed limitations are

clearly sufficient to distinguish the claimed invention from the cited art. Reconsideration of the application and an early Notice of Allowance are earnestly solicited.

If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below. Applicants hereby petition for an extension of time which may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-0388 (Order No. LAM1P128).

Respectfully submitted

BEYER WEAVER & THOMAS, LLP



R. Mahboubian

Registration No. 44,890

P.O. Box 778
Berkeley, CA 94704-0778
(650) 961-8300